CLAIMS

What is claimed is:

1. A multiple-channel medium access collision-avoidance method for transmission of data packets between nodes of a wireless communication network, comprising:

requiring all nodes in a network to follow a common channel-hopping sequence;

wherein all nodes that are not sending or receiving data, at a given time, listen on a common channel-hop.

2. A method as recited in claim 1, wherein to send data, nodes engage in a receiver-initiated dialogue over the channel-hop in which they find themselves at the time they acquire data to be sent.

3. A method as recited in claim 3, wherein nodes having a successful collision-avoidance handshake can remain in the same channel-hop for the duration of their data transfer, while the remaining nodes that are not subject to receiving or transmitting data continue to follow the common channel-hopping sequence.

4. A method as recited in claim 1, wherein a channel is selected from the group consisting essentially of a frequency hop, a spreading code, a combination of frequency hop and spreading code, and a hopping sequence.

5. A method as recited in claim 1, wherein a receiving node polls a sending node for data packets.

6. A method as recited in claim 1, wherein both a polling node and a polled node can transmit data after a successful handshake.

7. A method as recited in claim 1, wherein data packet collisions are eliminated without the need for carrier-sensing or code assignments.

8. A multiple-channel medium access collision-avoidance method for transmission of data packets between nodes of a wireless communication network, comprising:

requiring all nodes in a network to follow a common channel-hopping sequence;

wherein all nodes that are not sending or receiving data, at a given time, listen on a common channel-hop; and

wherein to send data, nodes engage in a receiver-initiated dialogue over the channel-hop in which they find themselves at the time they acquire data to be sent.

9. A method as recited in claim 8, wherein nodes having a successful collision-avoidance handshake can remain in the same channel-hop for the duration of their data transfer, while the remaining nodes that are not subject to receiving or transmitting data continue to follow the common channel-hopping sequence.

10. A method as recited in claim 8, wherein a channel is selected from the group consisting essentially of a frequency hop, a spreading code, a combination of frequency hop and spreading code, and a hopping sequence.

11. A method as recited in claim 8, wherein a receiving node polls a sending node for data packets.

12. A method as recited in claim 8, wherein both a polling node and a polled node can transmit data after a successful handshake.

13. A method as recited in claim 8, wherein data packet collisions are eliminated without the need for carrier-sensing or code assignments.

14. A multiple-channel medium access collision-avoidance method for transmission of data packets between nodes of a wireless communication network, comprising:

requiring all nodes in a network to follow a common channel-hopping sequence;

wherein all nodes that are not sending or receiving data, at a given time, listen on a common channel-hop; and

wherein nodes having a successful collision-avoidance handshake can remain in the same channel-hop for the duration of their data transfer, while the remaining nodes that are not subject to receiving or transmitting data continue to follow the common

channel-hopping sequence.

15. A method as recited in claim 14, wherein to send data, nodes engage in a receiver-initiated dialogue over the channel-hop in which they find themselves at the time they acquire data to be sent.

16. A method as recited in claim 14, wherein a channel is selected from the group consisting essentially of a frequency hop, a spreading code, a combination of frequency hop and spreading code, and a hopping sequence.

17. A method as recited in claim 14, wherein a receiving node polls a sending node for data packets.

18. A method as recited in claim 14, wherein both a polling node and a polled node can transmit data after a successful handshake.

19. A method as recited in claim 14, wherein data packet collisions are eliminated without the need for carrier-sensing or code assignments.

20. A multiple-channel medium access collision-avoidance method for transmission of data packets between nodes of a wireless communication network, comprising:

requiring all nodes in a network to follow a common channel-hopping sequence;

wherein all nodes that are not sending or receiving data, at a given time, listen on a common channel-hop;

wherein nodes having a successful collision-avoidance handshake can remain in the same channel-hop for the duration of their data transfer, while the remaining nodes that are not subject to receiving or transmitting data continue to follow the common channel-hopping sequence; and

wherein to send data, nodes engage in a receiver-initiated dialogue over the channel-hop in which they find themselves at the time they acquire data to be sent.

21. A method as recited in claim 20, wherein a channel is selected from the group consisting essentially of a frequency hop, a spreading code, a combination of frequency hop and spreading code, and a hopping sequence.

22. A method as recited in claim 20, wherein a receiving node polls a sending node for data packets.

23. A method as recited in claim 20, wherein both a polling node and a polled node can transmit data after a successful handshake.

24. A method as recited in claim 20, wherein data packet collisions are eliminated without the need for carrier-sensing or code assignments.

25. A multiple-channel medium access collision-avoidance method for transmission of data packets between nodes of a wireless communication network, comprising:

requiring all nodes in a network to follow a common channel-hopping sequence;

wherein a channel is selected from the group consisting essentially of a frequency hop, a spreading code, a combination of frequency hop and spreading code, and a hopping sequence;

wherein all nodes that are not sending or receiving data, at a given time, listen on a common channel-hop;

wherein nodes having a successful collision-avoidance handshake can remain in the same channel-hop for the duration of their data transfer, while the remaining nodes that are not subject to receiving or transmitting data continue to follow the common channel-hopping sequence; and

wherein to send data, nodes engage in a receiver-initiated dialogue over the channel-hop in which they find themselves at the time they acquire data to be sent.

26. A method as recited in claim 25, wherein a receiving node polls a sending node for data packets.

27. A method as recited in claim 25, wherein both a polling node and a polled node can transmit data after a successful handshake.

28. A method as recited in claim 25, wherein data packet collisions are eliminated without the need for carrier-sensing or code assignments.

29. A multiple-channel medium access collision-avoidance method for transmission of data packets between nodes of a wireless communication network, comprising:

requiring all nodes in a network to follow a common channel-hopping sequence;

where a channel is selected from the group consisting essentially of a frequency hop, a spreading code, a combination of frequency hop and spreading code, and a hopping sequence.

30. A method as recited in claim 29, wherein all nodes that are not sending or receiving data, at a given time, listen on the common channel hop.

31. A method as recited in claim 30, wherein to send data, nodes engage in a receiver-initiated dialogue over the channel-hop in which they find themselves at the time they acquire data to be sent.

32. A method as recited in claim 31, wherein nodes whose collision-avoidance handshake succeeds can remain in the same channel hop for the duration of their data transfer, while the remaining nodes that are not subject to receiving or transmitting data, continue to follow the common channel hopping sequence.

33. A method as recited in claim 32, wherein a receiving node polls a sending node for data packets.

34. A method as recited in claim 32, wherein both a polling node and a polled node can transmit data after a successful handshake.

35. A method as recited in claim 32, wherein data packet collisions are eliminated without the need for carrier-sensing or code assignments.

36. A multiple-channel medium access collision-avoidance protocol for execution by nodes of a network for the communication of data packets therebetween, comprising:

adhering to a common channel-hopping sequence by each of said nodes;

listening on channel hops within said common channel-hopping sequence when not transferring said data packets;

engaging in a receiver-initiated handshake over a channel hop when data is available for sending;

adhering to a new channel hopping sequence if the receiver-initiated handshake is successful;

transferring data while adhering to said new channel-hopping sequence; and

resynchronizing with the common channel hopping sequence at the completion of the data transfer.

37. A method as recited in claim 36, wherein to send data, nodes engage in a receiver-initiated dialogue over the channel-hop in which they find themselves at the time they acquire data to be sent.

38. A method as recited in claim 36, wherein nodes having a successful collision-avoidance handshake can remain in the same channel-hop for the duration of their data transfer, while the remaining nodes that are not subject to receiving or transmitting data continue to follow the common channel-hopping sequence.

39. A method as recited in claim 36, wherein a channel is selected from the group consisting essentially of a frequency hop, a spreading code, a combination of frequency hop and spreading code, and a hopping sequence.

40. A method as recited in claim 36, wherein a receiving node polls a sending node for data packets.

41. A method as recited in claim 36, wherein both a polling node and a polled node can transmit data after a successful handshake.

42. A method as recited in claim 36, wherein data packet collisions are eliminated without the need for carrier-sensing or code assignments.

43. A method as recited in claim 36:

wherein a clear-to-send (CTS) or equivalent control packet is transmitted by a polled node if no data has been received for transmission to a polling node; and

wherein transmitting of data by said polling node may commence toward said polled node if available at said polling node.

44. A method as recited in claim 43, wherein said clear-to-send packet carries a value which specifies a base frequency of the destination hop.

45. A method as recited in claim 36:

wherein a ready-to-receive (RTR) or equivalent control packet is indicative of a polling node requesting to transmit data to a polled node; and

wherein said polling node transmits data to said polled node subsequent to data receipt from said polled node and the sending of an acknowledgment to said polled node.

46. A method as recited in claim 45:

wherein transmitting of multiple RTR packets within a one-way propagation delay causes collision; and

wherein upon detecting said collision, said nodes back off and attempt the process at a later time.

47. A method as recited in claim 46, wherein said later time for retrying the transmission of an RTR packet is determined based on a time interval which includes a random time component.